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DETECTION OF DOUGLAS-FIR TUSSOCK MOTH IN THE INTERMOUNTAIN REGION USING BAITED STICKY TRAPS

State and Private Forestry
Forest Insect and Disease Management
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DETECTION OF DOUGLAS-FIR TUSSOCK MOTH IN THE INTERMOUNTAIN REGION USING BAITED STICKY TRAPS[1,2]

INTRODUCTION

The Douglas-fir Tussock Moth Research and Development Program helped initiate a wide variety of activities on Douglas-fir tussock moth. One in which Forest Insect and Disease Management, R-4, became involved was to determine the geographic distribution of Douglas-fir tussock moth, Orgyia pseudotsugata McD., in the Intermountain Region. Personnel from Forest Insect and Disease Management conducted surveys for Douglas-fir tussock moth distribution from 1975 through 1977.

HISTORY

Outbreaks of Douglas-fir tussock moth in the Intermountain Region are summarized in Tunnock and Ollieu (1978) and shown in Figure 1. The Intermountain Region reported the first Douglas-fir tussock moth outbreak in the United States at Jarbidge, Nevada in 1927 (Balch, 1930). In 1928 infestations of Douglas-fir tussock moth were detected on the old Weiser (Payette) National Forest, Boise National Forest, and Craters of the Moon in Idaho. Infestations were reported in the 1930's again on the Jarbidge Division, Humboldt National Forest in Nevada, and on the Sawtooth and Lemhi (Salmon) National Forests in Idaho. Infestations in the 1940's occurred on the Sawtooth National Forest and Owyhee Mountain fir stands in southwest Idaho. Outbreaks in the 1950's were reported from Wheeler Peak, Humboldt National Forest in Nevada, and Owyhee Mountains in Idaho. The 1960's saw infestations in Nevada at Highland Peak near Pioche and in the Spring Mountains near Las Vegas on the Toiyabe National Forest. Idaho infestations in the 1960's south of the Salmon River occurred on the Boise and Sawtooth National Forests and in the Owyhee Mountains. Infestations recorded from 1970 through 1977 have occurred at five general locations: Virgin Peak which lies east of Mesquite, and the Spring Mountains in Nevada, and south of the Salmon River in Idaho on the Sawtooth National Forest, in the Owyhee Mountains, and on a windbreak near Rupert (Figure 1).

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METHODS

The survey involved the use of sticky traps baited with synthesized Douglas-fir tussock moth sex attractant. The attractant, cis-6-heneicosen-11-one, had been isolated and synthesized by Dr. Gary Daterman, Pacific Northwest Forest and Range Experiment Station, and others (Daterman et al, 1976, Smith et al, 1975). Traps were distributed throughout the range of Douglas-fir and true firs in the Intermountain Region during the survey. These host types occur on all National Forests within the Intermountain Region to one degree or another. Traps were hung at approximately head height in host trees from early August to October which coincides with the flight period of the male Douglas-fir tussock moth. In October, traps were collected and examined in the laboratory. Photographs and taxonomic keys provided by Daterman were used to identify moth specimens (Daterman et al, 1977). Questionable specimens were forwarded to him for identification.

RESULTS

Male Douglas-fir tussock moths were trapped on 12 of the 16 National Forests in the Intermountain Region between 1975 and 1977. Sites where traps caught one or more Douglas-fir tussock moth males are shown in Figure 1. Intermountain Forests which produced Douglas-fir tussock moths were: Boise, Challis, Payette, Salmon, Sawtooth and Targhee in Idaho, Humboldt and Toiyabe in Nevada, and Fishlake, Manti-LaSal, Uinta and Wasatch in Utah. Those National Forests which were trapped but on which response was negative were: Caribou in Idaho, Ashley and Dixie in Utah, and Bridger-Teton in Wyoming. Trapping sites in 1975 were limited to known outbreak areas, and though male Douglas-fir tussock moths were collected, those sites are only shown as "Outbreak Areas" in Figure 1.

Besides trapping Douglas-fir tussock moth males, the bait lured other closely related species. The western tussock moth, Orgyia cana (Edwards) and the rusty tussock moth, Orgyia antigua (L.) were both collected in the sticky traps as well. Western tussock moth was collected commonly in west central Idaho. In addition, western Wyoming had one confirmed site and northern Utah had two confirmed sites (Figure 2). Confirmed rusty tussock moth sites are shown in Figure 3. Eastern Idaho and western Wyoming showed the greatest concentration of confirmed rusty tussock moth sites. Others were collected in west central Idaho and in northern and central Utah.

DISCUSSION

The survey certainly helped determine the geographic distribution of Douglas-fir tussock moth in the Intermountain Region. Several Forests on which Douglas-fir tussock moth had not been collected previously did produce confirmed sites. This would indicate that the Douglas-fir tussock

moth occurs throughout most of the host type within the Intermountain Region and that outbreaks occur from buildups of inplace populations. Forests with host type which showed negative results may produce Douglas-fir tussock moth if surveyed in future years. The northern portion of the Targhee National Forest gave negative results in 1976 whereas in 1977, three sites were confirmed as positive.

This survey technique was designed for qualitative detection (presence or absence) of Douglas-fir tussock moth. A concurrent study was conducted to determine proper pheromone dosages for quantitative population measurements (Daterman et al, 1978). Such a study should help provide prediction techniques for future population buildups, allowing forest resource managers time to prepare for outbreaks.

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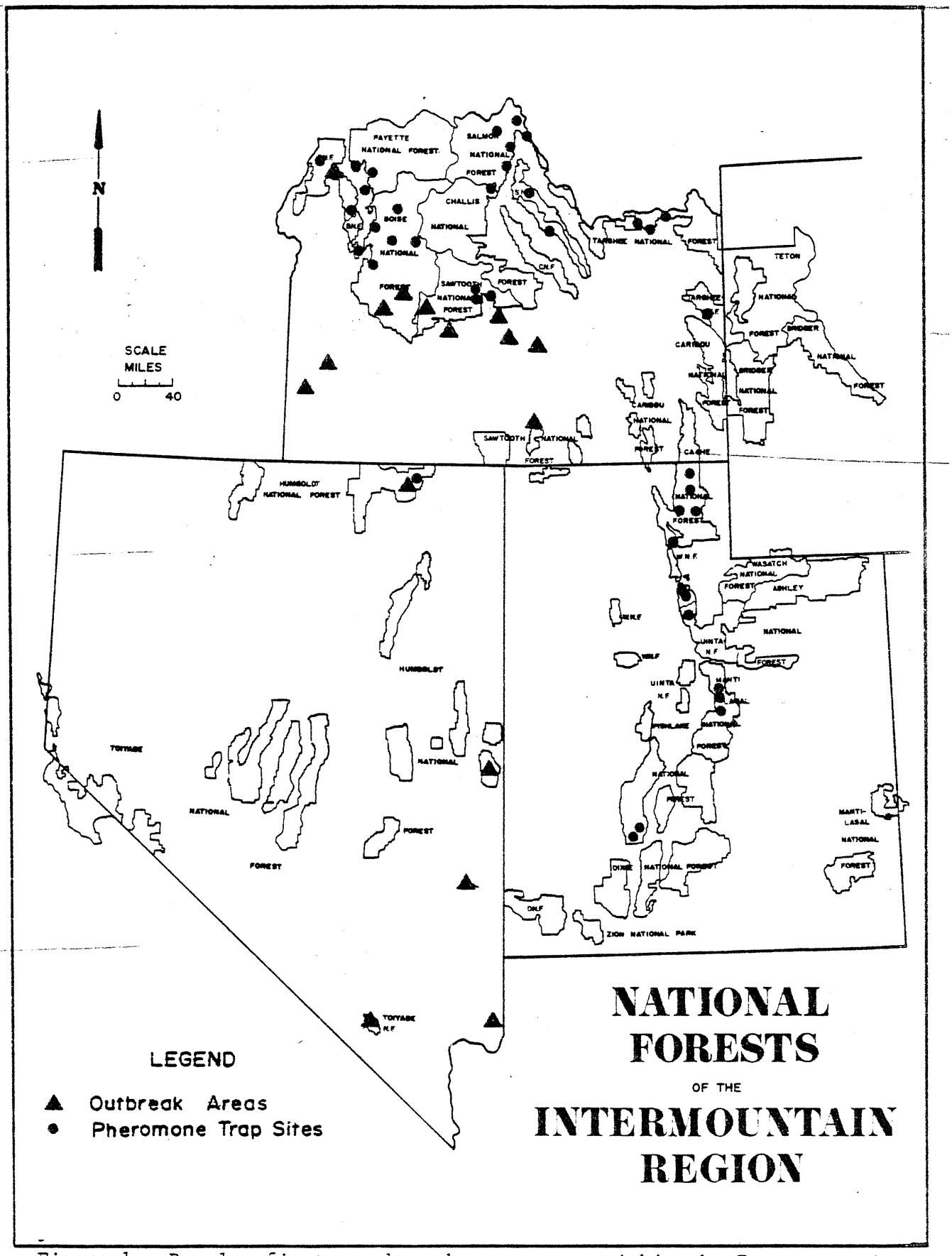

Figure 1. Douglas-fir tussock moth occurrence within the Intermountain Region

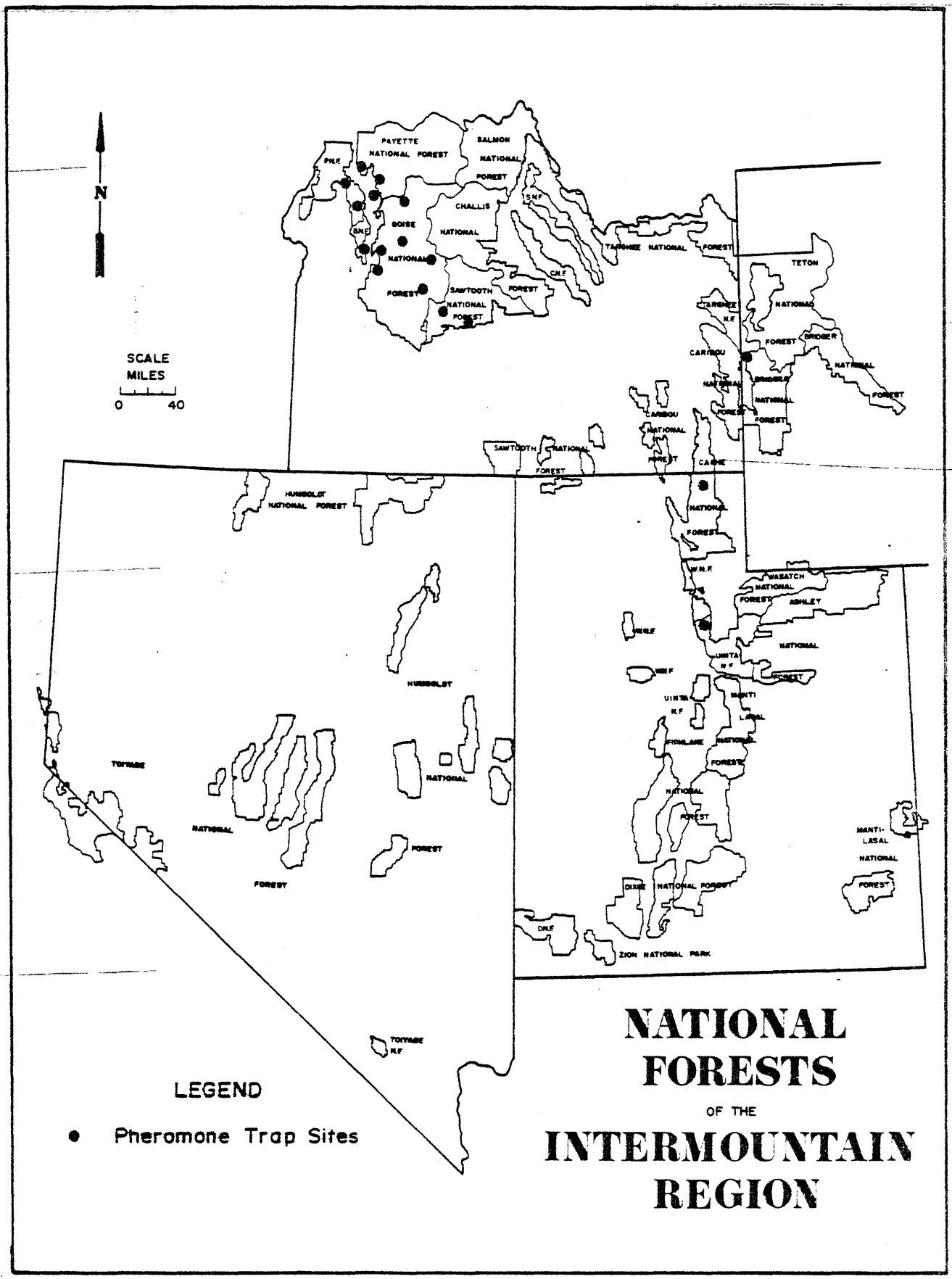

Figure 2. Western tussock moth occurrence within the Intermountain Region

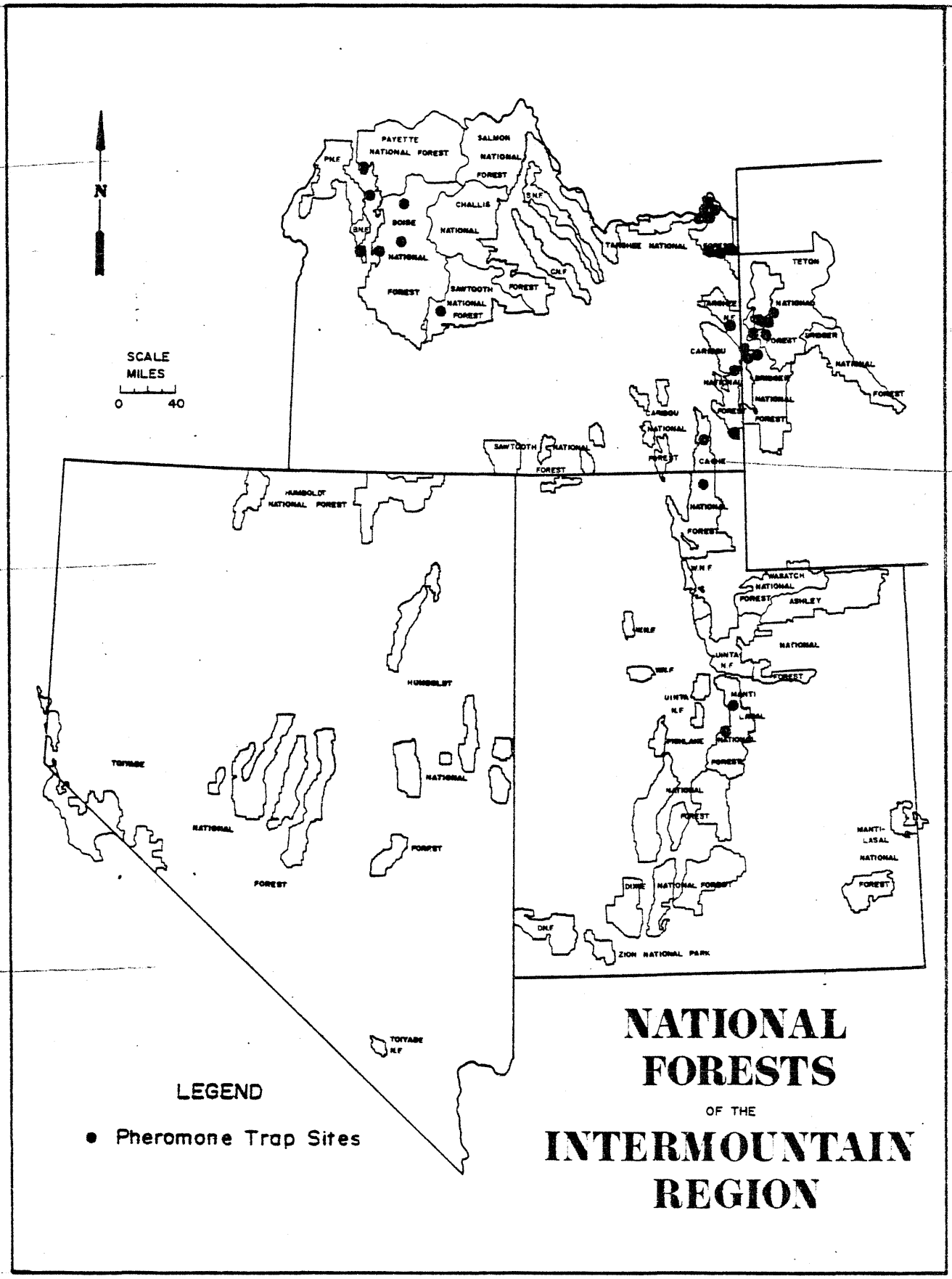

Figure 3. Rusty tussock moth occurrence within the Intermountain Region